

REMARKS

Claims 1, 3, 4, 8, 9 and 17 have been amended, claims 2, 5 to 7, 10 to 12, 14 to 17, 18 to 21 cancelled, 22 and 23 withdrawn and claims 24, 25, 26 and 27 added. Reconsideration of the application, as amended, is respectfully requested.

In the Office Action written November 17, 2003 the Examiner indicated that newly submitted claims 22 and 23 are directed to an invention that is independent or distinct from the invention originally claimed. The Examiner will note that claims 22 and 23 have been withdrawn from the present application.

Claims 1, 3 to 5, 13, 14, 15, 16 and 19 to 21 stand rejected under 35 USC 102(e) as being anticipated by U.S. Patent 6,342,150 to Sale et al. Additionally, claims 2, 7, 8, 17 and 18 stand rejected under 35 USC 103(a) as being unpatentable over Sale et al. in view of Zappi et al. (6,328,875).

The Examiner will note that claim 1 has been rewritten in order to clearly emphasize the aspects of the invention which are not taught or suggested in Sale et al.

The present application relates to a flow through electrochemical reactor for the treatment of wastewater from an industrial process and more specifically a debarking process. Organic compounds such as phenols and cresols are particularly harmful byproducts of the debarking process. It is, therefore, important that the concentration of such compounds in the wastewater be lowered to an environmentally acceptable level so as not be a source of serious contamination.

In an industrial debarking process large quantities of wastewater are produced and there needs to be an efficient and reliable method of lowering concentrations of these organic compounds quickly. In order to be able to accomplish this goal the wastewater needs to be treated at high flow rates in, preferably, an open re-circulating system. The system is open with respect to a reservoir so that gasses such as carbon dioxide can escape.

As clearly described in the present application the wastewater is pumped through the reactor at rates of at least 60 litres/min. thus the components of the chamber must be capable of withstanding such flow rates. In order to satisfy this requirement Applicants herein have invented a novel type of sponge like metallic electrodes which are configured to cause sufficient turbulence to generate and promote oxidation activity and yet allow the waste water to flow through the chamber with minimal resistance.

In order to achieve the oxidation activity the sponge type metallic electrodes are created using a titanium substrate with a coating of antimony doped tin oxide.

The Sale et al. reference is clearly intended to treat waste water at very low flow rates. Throughout the specification this concept is respectfully confirmed by statements such as may be found on column 3 beginning at line 50 wherein "The system relies upon the natural flow of the groundwater to

move contaminants through the system and to encourage electron transfer". Also please see column 5, line 60 wherein the rate of 1 foot per day velocity is given and this rate is set out in both examples wherein the flow rate is identified as being approximately one foot per day. Clearly, a system that is designed and constructed to withstand flow rates of one foot per day cannot be equated to a high flow rate system such as now claimed in the amended claims set forth herewith. It is further of interest to note that spacers which are described as non-conducting spacers 46 in Sale et al. could be made of for example thermoplastic or glass. There is no further specific discussion as to the nature of these spacers but as they are not required to permit flow-through of wastewater at a high flow rate there would appear to be no reason why they should be anything other than of non-porous materials.

For at least these reasons it is submitted that the claims as presented herewith and which require that the system is intended for use in a recirculating system and capable of withstanding a flow of 60 liters/min. or more for the lowering of the phenol and cresols concentration at a high flow rate is not taught or suggested by Sale et al.

With respect to Zappi et al. it should be noted that again the reactor apparatus or the electrolytic apparatus permits the wastewater to basically seep through or to flow laterally across the various combination of electrodes in free fall in other words the waste water is not forced through the chamber at a high flow rate such as would be generated by the open recirculating and pumped system of the present invention. The electrolytic apparatus or cell as described by Zappi et al. is characterized as being open in column 4 beginning at line 33 wherein "Because the configuration of electrochemical cells of the invention is open, and not sealed, allowing for controlled leakage of aqueous electrolyte solution and gaseous by-products, sealed cell designs, including gaskets, O-rings and other sealing devices are eliminated".

Further in column beginning at line 44 "In the open configuration cells of this invention electrolyte is fed directly to the electrodes in the electrolyzer zone from a feeder which may be positioned centrally relative to the face of the electrodes, for example, where the contaminated solution engages with the electrodes by flowing through very narrow electrode gaps or spaces between the electrodes." In column 5, beginning at line 13 "The aqueous solution entering the cell cascades over and through available interelectrode gaps and on exiting the electrolyzer zone of the cell through gravitational forces descend downwardly into a reservoir for post treatment, for example, or discharge such as into a natural water way".

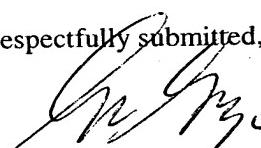
The claims in the present application are directed to a reactor which, as indicated above, is part of a recirculatory system where the waste water may be circulated through once or several times depending on the level of organic compounds in the original waste water.

In view of the foregoing it is believed that the amended claims are not taught or suggested by the cited references whether taken singularly or in combination.

It is further submitted that the amendments to the claims focus on elements alluded to or covered in the claims previously on file and that there should, therefore, be no rejection on the basis of new issues.

Allowance of the claims as submitted herewith at an early date is earnestly solicited.

Respectfully submitted,



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